

Determination of the optical constants of the active layer of a suspended particle device smart window with multilayer structure, at the clear and dark states, with and without applied voltage

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Smart windows based on suspended particle devices (SPD) are able to switch optically from dark to clear visual appearance when applying an AC electrical signal. This effect is due to light absorbing nanoparticles that get aligned by the applied voltage. The sandwich structure of a SPD consist of several layers and includes two outer glass substrates, each one covered on its inwards-facing side with a transparent conducting thin layer surrounding the centrally positioned SPD active layer. A knowledge of the optical constants of each layer—i.e., the complex refractive index, including its real and imaginary (absorption) parts—is a key in the design of the visual appearance of the SPD window and is a useful tool to determine the optimum thickness of the active layer.

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